MONTHLY WEATHER REVIEW,

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WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

In compiling the Review for June the following data have been made use of, viz: The weather charts constructed three times per day from the simultaneous observations taken at eighty-eight Signal Service and fourteen Canadian stations; monthly weather reports from four hundred and forty-five stations, classified as Voluntary Observers, Army Posts, Naval Hospitals, Canadian and Signal Service stations; special reports; reliable newspaper extracts; and Marine Records.

The principal meteorological features of the month have been: first, the absence of any extensive storm and the small number of severe winds; second, the unusually heavy rains in the South Atlantic States; third, the unprecedented high water in the Upper Missouri river and in the rivers of Oregon; fourth, the extensive occurrence of thunder-storms and the feeble auroral displays; fifth, the numerous local tornadoes.

BAROMETRIC PRESSURE.

In General.—The general distribution of barometric pressure during the month is shown by the isobars upon Chart No. I, from which it will be seen that the highest monthly mean is reported from Oregon, while the pressure was comparatively low in California. On the eastern side of the Rocky Mountains the pressure has averaged highest (30.03 to 30.06) on the South Atlantic coast, whence it has diminished regularly in all directions; to 29.99 on the Texas coast; to 29.91 in the St. Lawrence valley, and 29.77 in western Dakota. As compared with June, 1875, the pressures have been lower, and especially over the Lake region and Minnesota. As compared with June, 1874, the pressures have been about the same, except decidedly higher in the St. Lawrence valley and Canadian Provinces. The history of changes in pressure during the month is simply a record of a succession of high pressures in Oregon and on the South Atlantic coast, with continued attempts at the formation of areas of low pressure in the interior of the country. The connection between barometric changes on the Pacific coast and those in the interior of the continent has not been so apparent as it is in the winter months. The heating of the dry air over the western plains, and the consequent inflow of cold air from all sides, both from the mountains on the west and from British America on the northeast and the Gulf States on the southeast, has been well marked. The areas of low pressure have been, with one exception, ill-defined and not very permanent; those of high pressure have at no time passed centrally over our territory, but have made themselves felt only on the borders, showing that an area of one thousand miles square is not sufficient for the complete elucidation of the movements of the atmosphere. The heavy rain-fall upon the coasts of Georgia and South Carolina from the 11th to the 17th, and the gales a short distance off the coast, which were, however, scarcely felt at the Signal Service stations, were not accompanied by any barometric depression, so far as yet heard from.

Areas of High Pressure—No. I—Pressure was highest off the South Atlantic on the 1st and 2nd.

II—moved from the Rocky Mountains southeastward on the 3rd; it was over Indian Territory on the 4th; over the Western Gulf States on the 5th; over the Eastern Gulf States on the 6th, and on the 7th was merged into the rising barometer on the South Atlantic coast. Pressure continued highest off the Carolina coast on the mornings of the 8th, 9th, 10th and 11th.

III.—During the 10th pressure rose decidedly in the valley and Gulf of the St. Lawrence and in the Canadian Provinces, and extending southward along the coast was merged into No. II. At 7:35 a. m. of the 12th the high pressure extended from South Carolina to Cape Breton, being higher in the latter. On the 13th the highest pressure was in Nova Scotia and the barometer had fallen slightly in the Middle Atlantic States and the interior of the country. The pressure was on the 14th and 15th highest in Nova Scotia, but had, on the latter day, fallen decidedly, while it had risen slightly over the Middle Atlantic States. Pressure continued high from Cape Hatteras to Cape Breton on the 16th; it had on the 17th fallen somewhat in the Middle States, and continued highest in Nova Scotia, where it was also highest on the 18th and 19th. It rose in the South Atlantic States on the 19th and still more on the 20th, on the morning of which day it had fallen in Nova Scotia.

IV.—The high pressure that was on the 14th, 15th and 16th off the Pacific coast and the low pressure then central in Missouri and the Upper Lake region were followed on the 16th by a rapid rise in Manitoba and Dakota, with northerly winds, but on the 17th pressure again fell.

V.—The barometer rose with southerly winds on the 19th in the South Atlantic and Gulf States and at 7:35 a. m. of the 20th pressure was as high in Georgia as in Nova Scotia; it continued highest in the Eastern Gulf States on the mornings of the 21st, 22nd and 23rd, and over the Western Gulf States on the 24th. Although it had generally fallen somewhat, at 7:35 a. m., of the 25th, it was highest on the Gulf coast but still falling decidedly, the greatest fall being reported from the stations in the extreme Northeast; on the 26th and 27th pressure was highest in Florida and Eastern Gulf coast and was rising both there and over the Lakes; on the 28th it had risen in the Gulf States and Lake region but continued highest in the former; on the 30th it was high in Florida but had fallen in most of the Gulf States.

VI.—Northwest winds, rising barometer and generally lower temperatures prevailed on the 27th in the Lake region and on the morning of the 28th pressure was higher from the Missouri valley to Lake Ontario than it had been for the previous five days; on the 29th this high barometer was over Illinois and Missouri, after which it disappeared.

Areas of Low Pressure.—I.—This depression appears at 7:35 a. m. of the 1st central in northeastern Dakota and southerly winds prevailed from the Alleghanies to the Rocky mountains; by 4:35 p. m. the depression had moved northeastward beyond our stations and pressure had risen in Minnesota and the Missouri valley; brisk south winds were reported on Lake Superior; the course of the central depression is too uncertain to be published on Map I.

II.—On the 2d there was formed a slight depression in the Arkansas valley, between the regions of warm southerly and cold northerly winds; the depression extended eastward, but without forming a well marked trough or oval. On the 3d, at 7:35 a. m., a slight depression was located near Toledo, which was central at 4:35 p. m. over western Pennsylvania and progressing slowly eastward was on the morning of the 4th over the State of New York and disappeared over New England after 11 p. m. of that day. The position of the central track, as charted on map I, is liable to considerable uncertainty.

III.—On the 5th, while a cold west gale prevailed at the summit of Pike's Peak, warm southerly winds prevailed over the plains between the Rocky Mountains and the Mississippi, extending rapidly northward, with falling barometer, until, at 4:35 p. m., of the 6th, the lowest pressure was central over Nebraska and Dakota, while cool northeast winds, with rising barometer, had extended southward over the Upper Lakes, and west winds, with rising barometer, were reported from the Pacific coast. During the next 24 hours the pressure rose in the Atlantic States, but fell, with north and west winds, over the interior of the continent, and at 4:35 p. m., of the 7th, the lowest pressure was on the southwest border of Minnesota, whence it moved slowly eastward, and was, at 4:35 p. m. of the 8th, in western Wisconsin. During the subsequent night this depression disappeared on the Upper Lakes, where the barometer continued rather low.

IV.—At 11 p. m. of the 8th, northerly winds were reported from Dakota, but, during the 9th, barometer fell to the westward of our stations, and the region of southerly winds and falling barometer extended from Texas to southern Dakota, while easterly winds, and stationary or rising barometer prevailed in Manitoba and Lake Superior. By 11 p. m. of the 9th, the depression had extended northward along the west border of Minnesota, with cool northerly winds to the westward, but brisk and high south winds on the eastern side. During the 10th, this depression disappeared in British America, leaving only southerly winds over the Lake region.

V.—During the 12th, the barometer fell decidedly on the California coast, and, simultaneously, there formed in the interior of the Gulf States a slight depression, which was, at 11 p. m., central in northern Alabama. During the 13th the area of falling barometer extended over a large region, and on the 14th, at 7:35

a. m., local depressions were found in Georgia and Indian Territory. On account of its uncertainty the track of this depression, if it had any, is not given on Chart No. I.

VI.—This, the principal area of low pressure, began to be developed on the 15th in Arkansas. The pressure was then high on the Atlantic coast, and the depression extended northward until by 4:35 p. m. of the 16th, the central area had moved into northern Illinois; during this day severe local storms prevailed on the Lakes, and lighter storms and rains over nearly the whole country east of the Rocky Mountains. During the 17th the lowest pressure remained in the neighborhood of Lake Michigan, while the highest pressure continued on the east Atlantic coast, but diminished in the Southern States, and rain fell more abundantly, with southeast winds, throughout the United States. On the 18th the principal depression continued moving northward over Lake Superior, although a subsidiary local area of low pressure is traced to Lake Erie, and the barometer continued low, but rising over Wisconsin until 11 p. m. of the 19th.

VII.—On the 28th and 29th rain fell generally in the interior of Texas, several very heavy local rains being reported in the Red River valley; the region of heavy rain moved slowly northward over Indian Territory, and in advance of it the pressure fell decidedly over Kansas, Missouri, etc. At 4:35 p. m of the 30th an area of low barometer apparently extended from Colorado, eastward through northern Kansas and southern Missouri to Mississippi. During the evening of the 30th a very heavy snow storm prevailed on Pike's Peak, where for two days the pressure had been rapidly falling. The subsequent history of this depression and its sudden violence in the Lake region belongs to July.

TEMPERATURE OF THE AIR.

In General.—The isothermal lines on Chart No. II show the general distribution of the temperature for the month, from which it appears that, in comparison with the average of many years, the temperature has been above the mean in the St. Lawrence valley, New England, the Lower Lake region, the Middle and South Atlantic States, and, to a less extent, on the Pacific coast. It has been slightly below the mean in the Upper Lake region, and decidedly below in Minnesota, upper Mississippi and lower Missouri valleys, Ohio valley and Tennessee. In comparison with June, 1875, but slight changes are noticed, except the somewhat lower temperatures in the Gulf States. The temperature in the Gulf States, Tennessee and the Ohio valley during the past month has averaged from 2 to 5 degrees below that of June, 1874. The average temperature at the summit of Mt. Washington has been 48°, and at the summit of Pike's Peak 31°. In June, 1874, these temperatures were, respectively, 43° and 35°, and in June, 1875, 43° and 34°. The temperature on the Pacific coast is generally considered to have been higher than ever before known.

Maximum Temperatures.—Maximum temperatures exceeding 95° have been reported as follows: 98° at Augusta, Mobile, St. Marks; 96° at Breckenridge and Washington; 97° Charleston, Denver, Kittyhawk, Memphis, Tybee Island, Vicksburg and Yankton; 99° Corsicana, Jacksonville, Montgomery, Savannah and Wilmington; 100° Dodge City and Norfolk; 101° North Platte; 111° Fort Sully; 115° at several stations in Arizona.

Minimum Temperatures.—Temperatures below 45° have been reported as follows: 40° at Alpena, La Crosse and Santa Fe; 44° Boston, Milwaukee, Evanston, Portland, Me. and Wytheville; 33° Bismarck; 37° Breckenridge, Colorado Springs and Marquette; 28° Cheyenne; 43° Davenport, New London and Omaha; 38° Denver and Yankton; 41° Fort Sully, Dodge City, Dubuque and Eastport; 36° Duluth and Manhattan; 39° Escanaba and St. Paul; 32° Mt. Washington; 42° New Haven, Salt Lake City and Springfield; 34° Pembina.

Ranges of Temperature.—The greatest ranges that have been reported during the month are at Alpena, 50°; Bismarck, 60°; Breckenridge, Denver, Dodge City, Yankton, 59°; Cheyenne, 65°; Colorado Springs, 56°; Dubuque, Omaha, 51°; Duluth, Salt Lake City, 52°; Marquette, St. Paul, 53°; North Platte, 68; Manhattan, 68°; Pembina, 57°; Fort Sully, 70°. The smallest ranges have been at Cape Hatteras, 32°; Cape May, Montgomery, 38°; Charleston, 31°; Galveston, 24°; Indianola, 20°; Jacksonville, 33°; Kittyhawk, Memphis, Rochester, 39°; Lexington, Mobile, Toledo, 35°; Mt. Washington, Savannah, Vicksburg, 34°; New Orleans, 26°; Cape Lookout, 27°; Punta Rassa, 22°; Tybee Island, 27°.

Frosts are reported as follows: On the 1st, Bangor, Me., Westboro, Mass., destructive; 1st, 2nd and 8th, Orono, Me.; 1st, 2nd, 3rd, 4th, 6th, 11th, 14th and 21st, Portland, Me.; 1st, 16th, 17th and 18th, severe at Plattsmouth, Neb.; 2nd, light at Gardiner, Me., Auburn, N. H.; 3rd, Breckenridge, Minn.; heavy on 3rd and light on the 4th Platte county, Neb.; on the morning of the 4th at Fort Pembina, Fort Sully, D. T., Moorhead, Minn., Neillsville, Wis.; 6th, Traverse City, Mich.; 18th, Crawford county, Iowa; 19th, severe at Abingdon, Ill., and light at Muscatine, Iowa and Wooster, Ohio; 21st, Monticello, Iowa.